

CLAIMS

1. A text entry input system, comprising:

a directional selection means, plus one or more buttons or equivalent user

5 input means;

a collection of linguistic objects;

an output device with a text display area; and

a processor which comprises an object search engine, a distance value
calculation module, a linguistic object module for evaluating and ordering linguistic
10 objects, and a selection component;

wherein said directional selection means is used to point in a direction of each
of the letters, or the letters' sub-word equivalents in each writing system, of a
linguistic object, said processor calculating a distance to find letters and weight
values for the letters in said pointing direction with said distance calculation module,
15 said processor retrieving a predicted list of linguistic objects based on the letters and
weight values with said object search engine, said processor evaluating and ordering
said predicted list of linguistic objects with said linguistic object module, and said
selection component being used to select a desired linguistic object from said
predicted list of linguistic objects.

2. The system of Claim 1, further comprising an on-screen keyboard representation of a ring of letters or the letters' sub-word equivalents in each writing system.
3. The system of Claim 2, wherein said on-screen keyboard is of any shape
5 selected from a group comprising circle, square, oval and polygon.
4. The system of Claim 1, further comprising a set of compass point letters, said compass point letters being placed at positions around in a linguistic object selection list, in a separate on-screen compass area, or around said directional selection means.
- 10 5. The system of Claim 2, wherein said letters have bottoms towards the center of said ring.
6. The system of Claim 2, wherein said letters have an alphabetical order, QWERTY order, or Dvorak order.
7. The system of Claim 2, wherein said letters start at the 12 o'clock or 9 o'clock
15 position.
8. The system of Claim 2, wherein said letters have a moving starting position.
9. The system of Claim 2, wherein said letters have a clockwise or counterclockwise layout.

10. The system of Claim 2, wherein each of said letters occupies different amount of radians depending upon use frequency.
11. The system of Claim 1, wherein a number of characters are printed around said directional input means.
- 5 12. The system of Claim 1, wherein said directional selection means is a joystick or an omni-directional rocker switch.
13. The system of Claim 12, wherein said joystick has at least a 10° precision.
14. The system of Claim 1, wherein said one or more buttons or equivalent user input means is comprised of at least four buttons independent of said directional
10 selection means.
15. The system of Claim 1, wherein said one or more buttons or equivalent user input means comprises a joystick or directional rocker switch.
16. The system of Claim 12, wherein said joystick or omni-directional rocker switch is a component of a multi-function video game controller.
- 15 17. The system of Claim 2, wherein said system provides auditory or visual feedback on each movement of said directional selection means.
18. The system of Claim 17, wherein said visual feedback is a solid or gradient-fill pie wedge shape appearing on said on-screen keyboard, said pie wedge shape being centered on a current selected direction.

19. The system of Claim 1, wherein said linguistic objects are ordered according to a linguistic model.

20. The system of Claim 19, where said linguistic model includes one or more of:

frequency of occurrence of a linguistic object in formal or conversational

5 written text;

frequency of occurrence of a linguistic object when following a preceding linguistic object or linguistic objects;

proper or common grammar of the surrounding sentence;

application context of current linguistic object entry; and

10 recency of use or repeated use of the linguistic object by the user or within an application program.

21. The system of Claim 1, wherein said list of predicted linguistic objects are ordered by a combination value of a calculated weighted distance value and a linguistic model.

15 22. The system of Claim 21, wherein said linguistic model comprises one or more of:

frequency of occurrence of a linguistic object in formal or conversational written text;

frequency of occurrence of a linguistic object when following a preceding linguistic object or linguistic objects;

proper or common grammar of the surrounding sentence;

application context of current linguistic object entry; and

5 recency of use or repeated use of the linguistic object by the user or within an application program.

23. The system of Claim 21, wherein the linguistic object with the highest combination value is selected by default.

24. The system of Claim 1, wherein the linguistic objects longer than the number
10 of actions of direction selection means are included in said list of predicted linguistic objects.

25. The system of Claim 1, further comprising a means for extending a selected linguistic object with completions.

26. The system of Claim 25, wherein said completions are displayed in a pop-up
15 list after a button press or directional input.

27. The system of Claim 1, further comprising a means for precisely selecting said letters of said linguistic object.

28. The system of Claim 1, wherein an exact spelling sequence is displayed in said text display area.

29. The system of Claim 1, wherein the last entered letter is indicated in said exact spelling sequence.

5 30. The system of Claim 2, wherein the last entered letter is indicated in said on-screen keyboard.

31. The system of Claim 1, further comprising a means to change the last entered letter.

32. A text input method using a directional selection means, wherein each
10 direction entered corresponds, directly or indirectly, to one or more letters or symbols, said method comprising the steps of:

a user indicating a desired direction using said directional input means;

recording the direction in an angular notation comprising radians, gradients, degrees, or an equivalent units; and

15 retrieving a letter from a table or database based on the angle recorded.

33. The method of Claim 32, wherein the angular direction is derived from recording the X-Y offset of a directional input device and converting that offset into an angular notation comprising radians, gradients, or degrees.

34. The method of Claim 33, wherein the conversion is a variation on the standard Cartesian to Polar formula of $\text{Angle} = \arctan(Y/X)$.

35. The method of Claim 32, wherein said letter retrieved can be one of any number of adjacent or nearby letters or symbols.

5 36. The method of Claim 32, wherein said possible matching letters are presented in order of predicted likelihood of desired match.

37. The method of Claim 32, wherein the letters presented are limited to those that match certain positions in linguistic objects listed in a database.

38. The method of Claim 32, wherein the letters are presented only in the context
10 of linguistic objects that the letters are a part of.

39. The method of Claim 32, further comprising the steps of:

retrieving a list of predicted linguistic objects which are corresponding to the sequence of various angles recorded.

40. The method of Claim 39, wherein the order of said list of predicted linguistic
15 objects is based on a combination value of a calculated weighted distance value and a linguistic model.

41. The method of Claim 40, wherein the linguistic model comprises one or more of:

frequency of occurrence of a linguistic object in formal or conversational written text;

frequency of occurrence of a linguistic object when following a preceding linguistic object or linguistic objects;

5 proper or common grammar of the surrounding sentence;

application context of current linguistic object entry; and

recency of use or repeated use of the linguistic object by the user or within an application program.

42. The method of Claim 39, further comprising the step of:

10 selecting a desired linguistic object from said list of predicted linguistic objects.

43. The method of Claim 32, wherein said directional input means is associated with an on-screen keyboard.

15 44. The method of Claim 43, wherein said on-screen keyboard comprises a ring of letters, numbers or other symbols.

45. The method of Claim 43, wherein said on-screen keyboard is represented in Polar or Cartesian coordinate system for calculation.

46. The method of Claim 39, wherein said list of predicted linguistic objects is retrieved from a vocabulary database, and wherein a plurality of linguistic objects stored in said vocabulary database is ordered according to a linguistic model.

47. The method of Claim 46, where said linguistic model comprises one or more of:

frequency of occurrence of a linguistic object in formal or conversational written text;

frequency of occurrence of a linguistic object when following a preceding linguistic object or linguistic objects;

proper or common grammar of the surrounding sentence;

application context of current linguistic object entry; and

recency of use or repeated use of the linguistic object by the user or within an application program.

48. The method of Claim 46, wherein said plurality of linguistic objects is stored in a mixed case format in said vocabulary database.

49. The method of Claim 46, wherein said vocabulary database further comprises a user database which stores linguistic objects added by the user.

50. The method of Claim 49, wherein said linguistic objects added by the user in said user database are ordered by length of linguistic object and recency of use.

51. The method of Claim 46, wherein said vocabulary database further comprises a recency database to support linguistic object prediction based on recency of use.

5 52. The method of Claim 40, wherein said calculated weighted distance value is calculated based on the angular difference between each selected direction and the corresponding letter or symbol in predicted linguistic objects.

53. The method of Claim 40, wherein said calculated weighted distance value is calculated based in part on the weight of each letter, said letter weight being
10 determined by its use frequency.

54. The method of Claim 39, wherein the user selects a partial linguistic object and continues with more directional inputs.

55. The method of Claim 54, wherein said list of predicted linguistic objects is filtered to only include linguistic objects that begin with said selected partial linguistic
15 object.

56. The method of Claim 39, wherein the user selects an entry from said list of predicted words and the highest-ranked word containing said selected entry remains selected upon the input of additional letters until said entry becomes invalid by further addition of letters.

57. The method of Claim 32, wherein said directional select means is a set of buttons.

58. The method of Claim 32, wherein said directional select means is a joystick or omni-directional rocker switch.

5 59. The method of Claim 43, wherein said on-screen keyboard further comprises a smart punctuation symbol, said smart punctuation symbol when retrieved is automatically interpreted as a punctuation symbol, diacritic mark or tonal indication at the place in the input sequence where a matching punctuation symbol, diacritic mark or tonal indication occurs in predicted words.

10 60. The method of Claim 32, wherein a set of buttons or a second directional selection means can be used alone or with said directional selection means, separately or simultaneously, to switch or choose input modes, to change from input to word selection, or to invoke other functions.

61. The method of Claim 42, further comprising the steps of:

15 invoking an undo means after selecting a linguistic object from said list of predicted linguistic objects; and

 displaying the previous retrieved letters and showing previously retrieved list of predicted linguistic objects.

62. The method of Claim 42, further comprising the steps of:

selecting a linguistic object from a text message; and

displaying the letters of said linguistic object as if said letters have been entered as exact letters and showing a retrieved list of predicted linguistic objects corresponding to said letters.